

The effects of including a callous–unemotional specifier for the diagnosis of conduct disorder

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Background: ‘With Significant Callous–Unemotional Traits’ has been proposed as a specifier for conduct disorder (CD) in the upcoming revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V). The impact of this specifier on children diagnosed with CD should be considered. **Methods:** A multi-site cross-sectional design with volunteers ($n = 1136$) in the third–seventh grades and 566 consecutive referrals (ages 5–18) to a community mental health center were used to estimate the prevalence rates of CD with and without the proposed specifier. In addition, the degree of emotional and behavioral (especially physical aggression) disturbance and level of impairment in youth with and without CD and with and without the specifier was evaluated. **Results:** In the community sample, 10%–32% of those with CD and 2%–7% of those without CD met the callous–unemotional (CU) specifier threshold depending on informant. In the clinic-referred sample, 21%–50% of those with CD and 14%–32% without CD met the CU specifier threshold depending on informant. Those with CD and the specifier showed higher rates of aggression in both samples and higher rates of cruelty in the clinic-referred sample. **Conclusions:** Results indicate between 10% and 50% of youth with CD would be designated with the proposed CU specifier. Those with CD and the specifier appear to be more severe on a number of indices, including aggression and cruelty. **Keywords:** Callous–unemotional traits, conduct disorder, DSM-V, aggression, youth.

Introduction

Research has supported the importance of callous–unemotional (CU) traits (e.g. lack of empathy and guilt) for understanding antisocial and aggressive youth. CU traits are a principal component of the construct of psychopathy (Cleckley, 1976) and CU traits in childhood and adolescence are predictive of psychopathy in adulthood, even after controlling for childhood conduct disorder (CD) and other childhood risk factors (Burke, Loeber, & Lahey, 2007; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007). For example, a study by Lynam et al. found that youth scoring high on psychopathic traits at age 13 (top 15%) were over three times more likely to have a psychopathy diagnosis at age 24. However, irrespective of its conceptual and empirical link to

the construct of psychopathy, there is substantial evidence to support the clinical utility and theoretical importance of CU traits in children and adolescents. Specifically, recent qualitative (Frick & Dickens, 2006; Frick & White, 2008) and quantitative (Edens, Campbell, & Weir, 2007; Leistico, Salekin, Decoster, & Rogers, 2008) reviews found that CU traits are predictive of a more severe, stable, and aggressive pattern of behavior in antisocial youth. Further, this association with severity of antisocial behavior is evident for both boys (Kruh, Frick, & Clements, 2005) and girls (Marsee & Frick, 2007) and for children as young as ages 3 and 4 (Kimonis et al., 2006). Importantly, youth with CU traits have a differential treatment response compared to other antisocial youth (Hawes & Dadds, 2005; Waschbusch, Carrey, Willoughby, King, & Andrade, 2007).

Crucially, the association between CU traits and severity of antisocial behavior does not seem to be adequately captured by current diagnostic criteria. Specifically, in clinic-referred children, CU traits designate a more severely troubled group within children who were diagnostically similar in their rates of CD and oppositional defiant disorder (ODD) (Christian, Frick, Hill, Tyler, & Frazer, 1997). Further, in a sample of high risk boys, CU traits were a unique predictor [odds ratio (OR) = 1.12, $p < .05$] of severe and persistent delinquent behavior after controlling for number of CD symptoms (Pardini & Fite, 2010). Although children high on CU traits are more likely to show an early onset to their severe

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conduct problems (Dandreaux & Frick, 2009; Silverthorn, Frick, & Reynolds, 2001) the current distinction made between childhood-onset and adolescent-onset CD is not sufficient to identify the CU subgroup. For example, in a sample of high risk boys followed into adulthood, CU traits predicted a higher likelihood of being a violent offender, even controlling for an onset of delinquency by age 10 (Loeber et al., 2005). Similarly, in a large ($n = 754$) prospective study of early adolescents in the seventh grade at the initial assessment, CU traits predicted adult (2 years posthigh school) arrests (standard $\beta = .87$, $p < .01$) and greater likelihood of having an antisocial personality disorder diagnosis (standard $\beta = .30$, $p < .05$), even controlling for childhood-onset CD (McMahon, Witkiewitz, & Kotler, 2010).

Callous-unemotional traits have also proven to be important for theoretical models of antisocial behavior. Frick and White reviewed a significant body of research demonstrating several differences in the social (e.g. response to parenting), cognitive (e.g. response to punishment), emotional (response to distress in others), and personality (e.g. level of thrill seeking) characteristics of antisocial youths with versus without CU traits (Frick & White, 2008). Other research has demonstrated important differences in the genetic contribution to conduct problems for children with and without CU traits. For example, in a large sample of 7-year-old twins, conduct problems in children with CU traits were found to be under strong genetic influence (heritability of .81), whereas conduct problems in children without elevated levels of CU traits showed a more modest genetic influence (heritability of .30; (Viding, Blair, Moffitt, & Plomin, 2005).

In response to this extensive body of research, the DSM-V ADHD and Disruptive Behavior Disorders Work Group has proposed the addition of a specifier, 'With Significant Callous Unemotional Traits', to the diagnosis of CD (Frick & Moffitt, 2010). A child or adolescent would have to meet full criteria for CD and exhibit two of the following four traits over at least a 12 month period: lack of remorse or guilt, callous-lack of empathy, unconcern about performance at school or work, and shallow or deficient affect. While there is a large body of evidence to support the predictive validity of CU traits, the impact of this newly proposed CU specifier on the diagnosis of CD has not been systematically studied.

Specifically, much of the research to date has used various assessment instruments, cut scores and informants to designate youth high on CU traits. Within primarily antisocial youths (i.e. incarcerated adolescents), percentages of persons with high CU traits have ranged from 13% to 36% (Caputo, Frick, & Brodsky, 1999; Corrado, Vincent, Hart, & Cohen, 2004; Forth, Hart, & Hare, 1990; Forth, Kosson, & Hare, 2003; Frick & Hare, 2001; Gretton, McBride, Hare, O-Shaughnessy, & Kumka, 2001).

In clinic-referred children (ages 6–13) with disruptive behavior disorder diagnoses, approximately 35% were also high on CU traits (Christian et al., 1997). Rowe et al. studied a nationally representative sample of 5–16 year olds ($n = 7,977$) and used a definition of significant CU traits that closely approximated the proposed specifier (i.e. the presence of two or more of a list of seven CU traits; Rowe et al., 2010). They reported that 2% of their sample met criteria for CD and 46% of those with CD had high rates of CU traits. Importantly, children with CD who were high on CU traits showed more severe behavioral problems ($b = 1.7$, $p < .001$) and were at higher risk for a CD diagnosis (OR = 13.8, $p < .001$) 3 years later.

Thus, the available research suggests that from 13% to 46% of antisocial youth would be designated with the proposed CU specifier. However, none of the studies to date have used the exact symptoms or cut-offs proposed for DSM-V. In the present multi-site cross-sectional study, our first goal was to create symptom counts of CU traits using the proposed DSM-V criteria and determine the number of youths with CD who would likely meet criteria for this specifier using different informants. Further, we compared the rates of the CU specifier in both clinic-referred and community samples. Finally, we tested differences between the two groups with CD on the level of their emotional and behavioral problems and clinical impairment. Given the importance of CU traits for designating a particularly aggressive subgroup of antisocial youth, we were particularly interested in whether the proposed specifier would designate a more aggressive subgroup of youth with CD.

Method

Participants – community sample

Participants in the community sample were 1,136 children in the third–seventh grades from two school systems in a small metropolitan area in the southeastern United States. The mean age of the sample was 10.65 ($SD = 1.60$) and 53% were girls. The two primary ethnic categories were Caucasian (77%) and African American (19%), which is representative of the region served by the two school systems. The mean Duncan's Socioeconomic Index (SEI; Hauser & Featherman, 1977) was 47.20 ($SD = 23.8$). Based on parental report, 21% of the sample had received some type of special education service through their school system.

All procedures were approved by the Institutional Review Board at the University of Alabama. Community participants were recruited through fliers sent home to their parents, which described the study and asked them to complete a consent form. All children in the appropriate grades were eligible to participate. A total of 1,136 parents returned the forms from approximately 4,000 eligible. Consenting parents were mailed packets that included study measures, and the child's teacher received measures to complete at school. For each child

who participated, \$10.00 was donated to the classroom teacher to use for educational supplies.

Participants – clinic sample

Participants in the clinic-referred sample were 620 children and adolescents ages 5–18 recruited from a community mental health center (CMHC) serving four urban sites in the Midwestern United States. Families were recruited from all intakes and 65% agreed to participate. Consistent with the typical rate of first appointments at these CMHC, 59% kept their first appointment. The youth needed to be between the age of 5 and 18, and the youth and caregiver needed to be conversant in spoken English to complete the interviews. Participants were excluded from the present analyses if they were diagnosed with a psychotic disorder ($n = 11$), pervasive developmental disorder ($n = 12$), or had missing or incomplete data ($n = 31$) leading to a final sample of 566 with a mean age of 10.62 ($SD = 3.39$) years. The primary ethnic category was African American (88%) and the next most common was Caucasian (6%) and 40% of the sample were girls. In terms of SES, approximately 95% of the participants were Medicaid eligible, representative of the counties served by the CMHC. The Institutional Review Boards of University Hospitals of Cleveland, Case Western Reserve University, and Applewood Centers, Incorporated approved all procedures. All youths provided written assent and guardians provided written consent. The interviewer met with the adolescent and parent separately and while the youth was being interviewed, the parents would complete questionnaires. When the parent was completing interviews, youths age 11–17 were given self-report questionnaires. Youths younger than 11 years did not complete the self-report instruments.

Materials – community and clinic sample

Callous-unemotional traits. The antisocial process screening device (APSD; Frick & Hare, 2001) is a 20-item rating scale that is commonly used to assess CU traits in children and adolescents. Four of the six items from the CU subscale consist of items forming the CU specifier: lack of remorse or guilt, lack of empathy, unconcerned about performance, and shallow or deficient affect. On the APSD, items are scored on a 3-point scale ranging from 0 ('not at all true') to 2 ('definitely true'). To form the specifier, items scored as definitely true were rated as present and the presence of two of the four items met the specifier threshold. In the community sample, the APSD was administered to parents and teachers. The parent and teacher ratings were correlated $r = .20$ ($p < .001$) and a combined-informant composite score was formed based on the highest rating of each symptom. If an informant was missing, the score of the available informant was used to determine the specifier. In the clinic-referred sample, the APSD was administered to all parents and youth (age 11 and older). Similar to the community sample, symptoms for the CU specifier were created using the higher score from the two informants (which were not correlated, $r = .06$, $p = .28$), or the available information if only one

was available. Using the combined-informant report, the four CU symptoms were all significantly positively correlated with one another, ranging from $r = .17$ ($p < .001$) to $r = .32$ ($p < .001$) in the community sample and from $r = .10$ ($p < .05$) to $r = .42$ ($p < .001$) in the clinic sample.

Measures – community sample

DSM-IV diagnostic assessment. The Children's Symptom Inventory-4 (CSI-4; Gadow & Sprafkin, 1994) is a standardized behavior rating scale designed to assess childhood disorders based on DSM-IV criteria. The CSI-4 was completed by parents ($n = 871$) and teachers ($n = 1,068$). Only the items assessing the symptoms of attention deficit hyperactivity disorder (ADHD), ODD, and CD were administered. Parents and teachers rated each symptom on a 0 ('Never') to 3 ('Very Often') scale and specific symptoms were rated as present if they were rated as 2 or 3. The parent and teacher ratings were combined similar to the procedure used for the CU specifier. Correlations between parent and teacher ratings ranged from $r = .29$ ($p < .001$) for the CD symptoms to $r = .58$ ($p < .001$) for ADHD symptoms. Research using a combination of parent and teacher reports on the CSI-4 reported good correspondence between CSI-4 scores and clinician diagnoses, with sensitivity rates of .87 (ADHD) and .89 (ODD) in a clinic-referred sample of children (Gadow & Sprafkin, 1994). At the request of the participating school systems, the CSI-4 CD items assessing vandalism, assault, and cruelty were omitted on teacher report forms; therefore, these items were assessed solely by parent report.

Measures – clinic sample

DSM-IV diagnostic interviews. In the clinic sample, DSM-IV diagnoses were based on the Kiddie Schedule of Affective Disorders and Schizophrenia for School-aged Children Present and Lifetime Version (KSADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1996). The KSADS-PL was administered to all participants and their families by a highly trained research assistant. Discrepancies between informants were resolved by reinterview and clinical judgment. All cases were reviewed by an expert consensus team, with the review always involving a licensed clinical psychologist and the rater conducting the KSADS-PL. Consensus meetings integrated the KSADS-PL, family history, and prior treatment history to assign a consensus diagnosis.

Emotional and behavioral functioning. Parents completed the child behavior checklist (CBCL; Achenbach, 1991a) and youth ages 11–17 completed the youth self-report (YSR; Achenbach, 1991b). The global and well-validated Externalizing composite was used in these analyses. Given that the standard Aggressive Behavior scale of the CBCL and YSR include a number of non-aggressive conduct problems (e.g. demands a lot of attention, sudden changes in mood or feelings, sulks a lot), a physical aggression scale was formed by summing three items specific to physical aggression (i.e. *gets in many fights; physically attacks people; threatens*

people). An additional cruelty subscale was formed by summing two items related to cruel behavior (i.e. *cruelty to animals; cruelty, bullying, or meanness to others*).

Quality of life and global assessment of functioning. Parents of children in the clinic sample completed the KINDL Questionnaire for Measuring Health-Related Quality of Life in Children (Ravens-Sieberer & Bullinger, 1998). This scale has proven to be related to various impairments associated with psychiatric diagnoses (Freeman et al., 2009). Parents completed 24 items in the six dimensions of physical well being, emotional well being, self-esteem, family, friends, and school. The six dimensions are combined to produce a total score for quality of life.

The Children's Global Assessment Scale (CGAS; Shaffer et al., 1983) is a global measure of impairment associated with psychiatric diagnoses. It is a single rating scale of severity of impairment ranging from 1 (most impaired) to 100 (healthiest). Interviewers rated each child's highest level of functioning within the past 2 weeks.

Data analysis

Chi-square (χ^2) analyses were used to assess prevalence rates of diagnoses and CU symptoms in the clinic and community sample. Analysis of covariance (ANCOVA) was used to evaluate differences across the four diagnostic groups (Control, CU-only, CD-only, and CD + CU) on continuous measures (CBCL, YSR, and quality of life/global assessment of functioning). These analyses controlled for appropriate covariates in the community (gender and race) and clinic (age) samples. Partial η^2 was used as the effect size estimate for these analyses. When *F* values were significant, we included post hoc comparisons between groups.

Results

Prevalence of CU traits

Table 1 reports the rate of the CU specifier in those children with a research diagnosis of CD in the

community sample. Of those with a diagnosis of CD based on parent or teacher report ($n = 185$), 59 (32%) met criteria for the specifier. The rate was 24% and 10% based on teachers and parents only. Importantly, 7%, 6%, and 2% of the sample without CD had two or more of the CU symptoms based on both informants, teachers and parents, respectively. These rates differed significantly from those with CD in each case. The prevalence rates for the individual CU symptoms in those with and without CD are also provided in Table 1. The rates range from 6% to 34% in children with CD and from 2% to 9% in those without CD. In all cases, the percentage with the symptom was significantly higher for CD children than non-CD children.

Table 2 presents the rate of the CU specifier in children diagnosed with CD in the clinic-referred sample. Of 71 children who met criteria for CD, 35 (50%) met criteria for the CU specifier by combined-informant report. The rate was 21% and 31% based on youth and parent reports alone. Importantly, 32%, 14%, and 23% of the clinical sample without CD had two or more CU symptoms based on both informants, youth, and parents, respectively. The rates of the specifier differed significantly between the CD and non-CD groups only for the combined-informant report [$\chi^2(1) = 8.56, p < .01$]. In the clinic-referred sample, the rate of the symptoms in youth with CD ranged from 4% to 51% and from 4% to 37% in youth without CD. Significant differences between those with and without CD emerged for the symptoms of 'is not concerned about how well he/she does at school/work' [$\chi^2(1) = 6.08, p < .05$] for parent report and combined-informant report [$\chi^2(1) = 4.61, p < .05$] and 'does not feel bad or guilty when he/she does something wrong' for combined-informant report [$\chi^2(1) = 7.90, p < .01$]. There were no significant differences, regardless of reporter, for the other CU symptoms in the clinic-referred sample.

Positive predictive power (PPP) and negative predictive power (NPP) for predicting the presence of the

Table 1 Prevalence of individual callous–unemotional symptoms in community sample

Symptom	Teacher or parent		Teacher		Parent	
	Non-CD ($n = 945$)	CD ($n = 185$)	Non-CD ($n = 887$)	CD ($n = 176$)	Non-CD ($n = 730$)	CD ($n = 145$)
3. Is not concerned about how well he/she does at school/work	89(9)	60(32) ^{a***}	70(8)	44(25) ^{f***}	24(3)	21(14) ^{k***}
12. Does not feel bad or guilty when he/she does something wrong	77(8)	62(34) ^{b***}	64(7)	52(30) ^{g***}	15(2)	14(10) ^{l***}
18. Is unconcerned about the feelings of others	77(8)	55(30) ^{c***}	61(7)	44(25) ^{h***}	19(3)	14(10) ^{m***}
19. Does not show feelings or emotions	53(6)	20(11) ^{d**}	35(4)	12(7) ⁱ	20(3)	8(6) ⁿ
CU trait criteria	64(7)	59(32) ^{e***}	50(6)	43(24) ^{j***}	14(2)	14(10) ^{o***}

Values in parentheses are in percentages. CD, conduct disorder; CU, callous–unemotional.

^a $\chi^2(1)^2 = 71.46^{***}$; ^b $\chi^2(1)^2 = 91.68^{***}$; ^c $\chi^2(1)^2 = 69.24^{***}$; ^d $\chi^2(1)^2 = 6.98^{**}$; ^e $\chi^2(1)^2 = 100.64^{***}$; ^f $\chi^2(1)^2 = 44.90^{***}$; ^g $\chi^2(1)^2 = 75.91^{***}$; ^h $\chi^2(1)^2 = 54.53^{***}$; ⁱ $\chi^2(1)^2 = 2.90$; ^j $\chi^2(1)^2 = 65.09^{***}$; ^k $\chi^2(1)^2 = 31.08^{***}$; ^l $\chi^2(1)^2 = 21.72^{***}$; ^m $\chi^2(1)^2 = 16.42^{***}$; ⁿ $\chi^2(1)^2 = 2.98$; ^o $\chi^2(1)^2 = 23.43^{***}$.

*** $p < .001$; ** $p < .01$.

Table 2 Prevalence of individual callous-unemotional symptoms in clinic-referred sample

Symptom	Youth or parent		Youth		Parent	
	Non-CD (n = 495)	CD (n = 71)	Non-CD (n = 239)	CD (n = 53)	Non-CD (n = 490)	CD (n = 71)
3. Is not concerned about how well he/she does at school/work	122(25)	26(37) ^{a*}	9(4)	2(4) ^f	115(24)	26(37) ^{k*}
12. Does not feel bad or guilty when he/she does something wrong	166(34)	36(51) ^{b**}	39(16)	13(25) ^g	141(29)	28(40) ^l
18. Is unconcerned about the feelings of others	124(25)	25(35) ^c	37(16)	10(19) ^h	92(19)	16(23) ^m
19. Does not show feelings or emotions	128(26)	26(37) ^d	88(37)	19(36) ⁱ	54(11)	11(16) ⁿ
CU trait criteria	157(32)	35(50) ^{e**}	33(14)	11(21) ^j	113(23)	22(31) ^o

Values in parentheses are in percentages. CD, conduct disorder; CU, callous-unemotional.

^a $\chi^2(1)^2 = 4.61^*$; ^b $\chi^2(1)^2 = 7.90^{**}$; ^c $\chi^2(1)^2 = 3.31$; ^d $\chi^2(1)^2 = 3.63$; ^e $\chi^2(1)^2 = 8.56^{**}$; ^f $\chi^2(1)^2 = 0.00$; ^g $\chi^2(1)^2 = 1.96$; ^h $\chi^2(1)^2 = 0.37$; ⁱ $\chi^2(1)^2 = 0.03$; ^j $\chi^2(1)^2 = 1.64$; ^k $\chi^2(1)^2 = 6.08^*$; ^l $\chi^2(1)^2 = 3.31$; ^m $\chi^2(1)^2 = 0.56$; ⁿ $\chi^2(1)^2 = 1.20$; ^o $\chi^2(1)^2 = 2.13$.

** $p < .01$; * $p < .05$.

Table 3 Positive and negative predictive power of callous-unemotional traits in clinic-referred and community sample

Community	PPP			NPP		
	Teacher or parent (n = 1,132)	Teacher (n = 1,061)	Parent (n = 877)	Teacher or parent (n = 1,132)	Teacher (n = 1,061)	Parent (n = 877)
3. Is not concerned about how well he/she does at school/work	.56	.57	.53	.96	.97	.96
12. Does not feel bad or guilty when he/she does something wrong	.68	.67	.59	.97	.98	.99
18. Is unconcerned about the feelings of others	.69	.70	.61	.95	.96	.99
19. Does not show feelings or emotions	.59	.55	.36	.92	.93	.98

Clinic	PPP			NPP		
	Youth or parent (n = 566)	Youth (n = 291)	Parent (n = 561)	Youth or parent (n = 566)	Youth (n = 291)	Parent (n = 561)
3. Is not concerned about how well he/she does at school/work	.74	.81	.63	.80	.88	.89
12. Does not feel bad or guilty when he/she does something wrong	.77	.52	.69	.90	.90	.95
18. Is unconcerned about the feelings of others	.85	.70	.88	.84	.95	.91
19. Does not show feelings or emotions	.64	.25	.69	.77	.91	.82

PPP, positive predictive power; NPP, negative predictive power.

CU specifier by the individual CU symptoms across reporters in both the community and clinic samples are reported in Table 3. In the community sample, PPP values for the individual CU traits ranged from .36 to .70 and NPP values ranged from .92 to .99. Although the symptoms generally had very similar PPP and NPP values, the symptom 'does not show feelings or emotions' by the parent report had a much lower PPP (.36) than the other indicators of the specifier. Also, the symptom 'unconcerned about the feelings of others' had the highest PPP values: .61, .70, and .69 for the parent, teacher, and combined-informant, respectively. The symptom 'does not feel bad or guilty when he/she does something wrong' had the highest NPP values: .99, .98, and .97 for

parent, teacher, and combined-informant, respectively. In the clinic-referred sample, PPP values for the individual CU symptoms ranged from .25 to .88 and NPP values ranged from .77 to .95. Again, the symptoms generally had very similar PPP and NPP values, with the exception of the very low PPP for the symptom 'does not show feelings or emotions' by youth self-report (.25). Again, the symptom 'unconcerned about the feelings of others' had the highest PPP values: .85, .70, and .88 for combined-informant, youth, and parent report, respectively. The symptom 'does not feel bad or guilty when he/she does something wrong' had the highest values for NPP: .90, .90, and .95, for combined-informant, youth, and parent report, respectively.

To better understand the prevalence of CU traits in children without CD, we divided the non-CD group into those with an ODD, with an ADHD or with no disruptive behavior disorder (No-DBD) based on parent and teacher reports on the CSI-4 (community sample) or by the expert consensus diagnosis from the K-SADS-PL (clinic-referred sample). We also examined the rate of participants with two (the specifier threshold), three, and four CU symptoms across these different groups. In the community sample, the CD group (32%) was significantly more likely than the No-DBD group (4%) to have youth with two CU symptoms based on parent and teacher report. However, the CD group did not differ from the ODD group (22%) or ADHD (26%) groups. Similar findings were reported using a threshold of three and four symptoms and when teacher and parent reports were examined individually. In the clinic-referred sample, the CD group (50%) was significantly more likely than the ADHD (28%) and No-DBD group (23%) to have youth with two CU symptoms based on youth and parent report. However, the CD group did not differ from the ODD group (41%). Again, similar findings were reported when using youth and parent report separately and when using a threshold of three symptoms. However, when the threshold was raised to four symptoms, too few youth met the threshold to obtain meaningful results. (Supporting data tables are available on the journal's website in an electronic appendix).

Comorbid symptoms/diagnoses – community sample

In the community sample, four groups were formed for further comparison: control, CU specifier only, CD-only, and CD with CU specifier (CD + CU). These groups were formed using parent report, teacher report only, and a combination of informants for the CU specifier. The groups were first compared on demographic variables and were found to differ significantly on race for parent report, [$\chi^2(3) = 34.72$, $p < .001$], teacher report, [$\chi^2(3) = 21.99$, $p < .001$], and for the combined-informant report [$\chi^2(3) = 29.45$, $p < .001$]. Significant differences were also found between groups on gender for the parent report [$\chi^2(3) = 27.58$, $p < .001$], teacher report [$\chi^2(3) = 34.99$, $p < .001$], and for the combined-informant report [$\chi^2(3) = 27.95$, $p < .001$]. In general, the gender differences were largely due to the control group having a greater percentage of girls (56%–59%) than the other three groups (29%–48%). In terms of the racial differences, this was due to the CU specifier only group having a greater percentage of African American youths (50%–77%) than the other three groups (19%–57%). Those participants who had teacher report only were excluded from these analyses, as gender and race were collected from parent report.

Next a series of ANCOVA's, controlling for gender and race, were conducted with total CD symptoms

and number of aggressive CD symptoms, symptoms of ODD and symptoms of ADHD as the dependent variables (see Table 4). In all cases, the overall ANCOVA was significant with effect sizes ranging from $\eta_p^2 = .161$ to $\eta^2 = .672$. The CD + CU group had more overall CD symptoms and more aggressive CD symptoms than the CD-only group, according to parent report and using the combined-informant report for the specifier. For the comparisons of ODD and ADHD symptoms, the CD + CU had a significantly greater number of symptoms than the CD-only group across all informants. In all of the comparisons, the CD + CU group had a significantly greater number of symptoms than the CU-only group.

Emotional and behavior problems – clinic sample

As was performed in the community sample, four groups of clinic-referred children were formed with and without CD and with and without the CU specifier. This was again done separately for each informant for the CU specifier. On demographic variables, groups differed only on age for combined [$F(3,550) = 7.95$; $p < .001$] and for parent [$F(3,545) = 7.18$; $p < .001$] report. Next, a series of ANCOVAs covarying age were performed using the externalizing scale from the CBCL and YSR and the aggressive behavior and cruelty scales formed for this study (See Table 5). For the externalizing composite, the groups differed significantly (η_p^2 ranging from .066 to .150). The two CD groups differed from the two non-CD groups but the two CD groups did not differ from each other. The groups also differed significantly on the physical aggression and cruelty scales (η_p^2 ranging from .085 to .163). The CD + CU group was significantly more severe than the CD-only group in four of the nine analyses across informants with these two scales. In all cases, except the CBCL cruelty scale, the CD + CU group differed significantly from the CU-only group.

Quality of life and global assessment of functioning-clinic sample

Similar ANCOVA analyses were conducted on the two measures of impairment, again controlling for age in all analyses. In five of the six analyses, there was an overall significant group effect (η_p^2 ranging from .019 to .107). However, in most analyses, the two CD groups showed greater impairment than the other groups of clinic-referred children but the two CD groups did not differ significantly from each other. (Supporting data tables are available on the journal's website in an electronic appendix).

Using aggression to subgroup youths with CD

Given that the CD + CU group was more aggressive, an important question is whether the presence of

Table 4 Group comparisons of conduct disorder symptoms and comorbid diagnostic symptoms in community sample

	Teacher or parent [†]				Test statistic	η_p^2
	Control (n = 669)	CU-only (n = 40)	CD-only (n = 98)	CD + CU (n = 39)		
CD symptoms						
Aggression	0.14(0.38) ^a	0.21(0.51) ^a	1.89(0.96) ^b	2.18(0.74) ^c	$F(3,840) = 444.83^{***}$.614
Symptom total	0.46(0.71) ^a	0.74(0.79) ^a	4.17(1.66) ^b	4.43(1.46) ^b		
Comorbid symptoms						
ODD SX	0.76(1.44) ^a	1.83(2.30) ^b	3.74(3.02) ^c	5.46(2.43) ^d	$F(3,840) = 144.40^{***}$.340
ADHD SX	1.34(2.80) ^a	4.07(4.91) ^b	4.85(5.44) ^b	8.10(5.70) ^c		
	Teacher				Test statistic	η_p^2
	Control (n = 628)	CU-only (n = 27)	CD-only (n = 104)	CD + CU (n = 24)		
CD symptoms						
Aggression	0.15(0.39) ^a	0.26(0.56) ^a	1.97(0.94) ^b	2.10(0.64) ^b	$F(3,777) = 406.43^{***}$.611
Symptom total	0.49(0.72) ^a	0.72(0.79) ^a	4.20(1.63) ^b	4.45(1.53) ^b		
Comorbid symptoms						
ODD SX	0.75(1.43) ^a	2.07(2.29) ^b	4.17(3.06) ^c	5.20(2.45) ^d	$F(3,777) = 136.26^{***}$.345
ADHD SX	1.41(2.85) ^a	4.91(5.05) ^b	5.19(5.58) ^b	9.08(5.60) ^c		
	Parent				Test statistic	η_p^2
	Control (n = 694)	CU-only (n = 13)	CD-only (n = 123)	CD + CU (n = 14)		
CD symptoms						
Aggression	0.14(0.39) ^a	0.21(0.58) ^a	1.94(0.97) ^b	2.32(1.08) ^c	$F(3,838) = 442.01^{***}$.613
Symptom total	0.47(0.71) ^a	1.04(0.88) ^b	4.16(1.67) ^c	4.96(2.29) ^d		
Comorbid symptoms						
ODD SX	0.78(1.47) ^a	2.83(3.01) ^b	4.07(2.98) ^c	5.62(2.10) ^d	$F(3,838) = 137.52^{***}$.330
ADHD SX	1.47(3.07) ^a	3.03(3.75) ^a	5.54(5.74) ^b	7.64(5.18) ^c		

ODD SX, oppositional defiant disorder symptom total; ADHD SX, attention deficit hyperactivity disorder symptom total; CD, conduct disorder; CU, callous-unemotional.

[†]Participants who only had teacher report were excluded from these analyses, as gender and race were only collected in the parent report; Means reported are least squares means adjusted for the covariates. Means with different superscripts differ significantly in pairwise comparisons.

*** $p < .001$.

aggression would designate a group similar to those designated by the presence of CU traits and thus, could be used for subtyping youths with CD. Within both samples, a highly aggressive subgroup was formed for individuals who had two or more aggressive CD symptoms on the CSI-4 (community) according to parent or teacher report or who had two more aggression or cruelty items scored 2 or higher on the parent reported CBCL (clinic-referred). In the community sample, the number of highly aggressive individuals ranged from 15(2%) for the control group, 3(5%) for the CU-only group, 92(73%) for the CD-only group, and 51(86%) for the CD + CU group [$\chi^2(3) = 726.12, p < .001$]. Similarly, in the clinic-referred sample, the rates of highly aggressive individuals ranged from 74(23%) in the control group, 50(33%) for the CU-only group, 22(65%) for the CD-only group, and 25(76%) for the CD + CU group [$\chi^2(3) = 59.84, p < .001$]. Thus, although in both samples the CD + CU group had the highest rate of highly aggressive individuals, a significant minority of youths in this group was not aggressive and aggression was not specific to this group of youths.

Discussion

In the community sample, our findings suggest that the proposed CU specifier would designate between 10% and 32% of children with CD. Further, the base rates of the CU specifier and the individual CU symptoms were fairly low in children without CD. In the clinic-referred sample, between 21% and 50% of children and adolescents with CD showed the CU specifier, depending on the informant. However, unlike in the community sample, a significant number of clinic-referred children without CD showed high rates of CU traits and this was especially true for children with an ODD diagnosis. Youth with CD and the CU specifier, as compared to CD youth without the specifier, exhibited significantly higher rates of aggressive behavior in both samples, as well as higher cruelty ratings within the clinic sample. These findings were present across different informants for assessing the specifier. In addition, youth with CU traits also demonstrated higher rates of comorbidity in the community sample. Within the clinic sample, there was no difference in the level of impairment between CD youth with and without CU

Table 5 Group comparisons on CBCL and YSR subscales in a clinic-referred sample

	Control	CU-only	CD-only	CD + CU	Test statistic	η_p^2
Youth or parent						
<i>CBCL</i>						
Externalizing	(<i>n</i> = 323) 67.51(10.08) ^a	(<i>n</i> = 145) 71.95(8.47) ^b	(<i>n</i> = 33) 77.09(7.49) ^c	(<i>n</i> = 32) 79.57(6.65) ^c	<i>F</i> (3,528) = 27.14***	.134
Aggression	(<i>n</i> = 316) 1.95(1.98) ^a	(<i>n</i> = 143) 2.60(1.99) ^b	(<i>n</i> = 33) 3.70(1.94) ^c	(<i>n</i> = 31) 4.83(1.58) ^d	<i>F</i> (3,518) = 26.74***	.134
Cruelty	(<i>n</i> = 303) 0.81(0.97) ^a	(<i>n</i> = 137) 1.37(1.08) ^b	(<i>n</i> = 33) 1.45(1.27) ^b	(<i>n</i> = 31) 2.27(1.10) ^c	<i>F</i> (3,499) = 26.04***	.135
<i>YSR</i>						
Externalizing	(<i>n</i> = 146) 56.48(10.12) ^a	(<i>n</i> = 85) 58.36(12.85) ^{ab}	(<i>n</i> = 25) 63.21(12.51) ^{bc}	(<i>n</i> = 26) 65.76(9.98) ^c	<i>F</i> (3,277) = 6.65***	.067
Aggression	(<i>n</i> = 140) 1.03(1.40) ^a	(<i>n</i> = 83) 1.16(1.40) ^a	(<i>n</i> = 25) 2.00(1.83) ^b	(<i>n</i> = 26) 2.42(1.90) ^b	<i>F</i> (3,269) = 8.38***	.085
Youth						
<i>CBCL</i>						
Externalizing	(<i>n</i> = 198) 67.11(9.62) ^a	(<i>n</i> = 30) 70.00(7.63) ^a	(<i>n</i> = 40) 76.44(7.48) ^b	(<i>n</i> = 11) 78.22(8.32) ^b	<i>F</i> (3,274) = 16.09***	.150
Aggression	(<i>n</i> = 195) 1.82(1.82) ^a	(<i>n</i> = 28) 2.41(2.12) ^a	(<i>n</i> = 39) 3.68(1.93) ^b	(<i>n</i> = 11) 4.56(1.51) ^b	<i>F</i> (3,268) = 17.42***	.163
Cruelty	(<i>n</i> = 197) 0.84(0.96) ^a	(<i>n</i> = 30) 1.10(0.76) ^{ab}	(<i>n</i> = 40) 1.69(1.31) ^c	(<i>n</i> = 11) 1.76(1.01) ^{bc}	<i>F</i> (3,273) = 10.06***	.100
<i>YSR</i>						
Externalizing	(<i>n</i> = 200) 56.64(11.18) ^a	(<i>n</i> = 30) 59.99(10.63) ^{ab}	(<i>n</i> = 40) 63.39(12.07) ^{bc}	(<i>n</i> = 11) 68.61(6.39) ^c	<i>F</i> (3,276) = 7.61***	.076
Aggression	(<i>n</i> = 192) 1.04(1.39) ^a	(<i>n</i> = 30) 1.23(1.45) ^a	(<i>n</i> = 40) 1.95(1.83) ^b	(<i>n</i> = 11) 3.18(1.72) ^c	<i>F</i> (3,268) = 10.32***	.104
Parent						
<i>CBCL</i>						
Externalizing	(<i>n</i> = 361) 67.79(9.91) ^a	(<i>n</i> = 104) 72.86(8.05) ^b	(<i>n</i> = 45) 77.26(7.60) ^c	(<i>n</i> = 20) 80.16(5.27) ^c	<i>F</i> (3,525) = 27.80***	.137
Aggression	(<i>n</i> = 352) 2.01(1.99) ^a	(<i>n</i> = 104) 2.68(1.96) ^b	(<i>n</i> = 45) 3.96(1.85) ^c	(<i>n</i> = 19) 4.84(1.65) ^c	<i>F</i> (3,515) = 24.82***	.126
Cruelty	(<i>n</i> = 341) 0.85(0.95) ^a	(<i>n</i> = 96) 1.50(1.12) ^b	(<i>n</i> = 45) 1.56(1.20) ^b	(<i>n</i> = 19) 2.45(1.12) ^c	<i>F</i> (3,496) = 26.73***	.139
<i>YSR</i>						
Externalizing	(<i>n</i> = 182) 56.73(10.66) ^a	(<i>n</i> = 44) 58.56(13.49) ^{ab}	(<i>n</i> = 37) 65.12(11.15) ^{bc}	(<i>n</i> = 14) 62.82(11.76) ^c	<i>F</i> (3,272) = 6.41***	.066
Aggression	(<i>n</i> = 176) 1.01(1.37) ^a	(<i>n</i> = 42) 1.36(1.51) ^{ac}	(<i>n</i> = 37) 2.32(1.97) ^b	(<i>n</i> = 14) 1.93(1.54) ^{bc}	<i>F</i> (3,264) = 8.68***	.090

Means reported are least squares mean adjusted for the covariate. Means with different superscripts differ significantly in pairwise comparisons.

CBCL, child behavior checklist; YSR, youth self-report; CD, conduct disorder; CU, callous-unemotional.

****p* < .001.

traits. Thus, in clinic-referred youth, children with CD appeared to be significantly impaired, irrespective of their level of CU traits.

The individual items that comprise the CU specifier showed very similar prevalence rates and predictive power. The one exception is the low prevalence rate of the item 'does not show feelings or emotions', which also showed the lowest PPP in the community and clinic-referred sample. Although the performance of this item was not low enough to recommend against including it in the specifier at this time, future research should continue to evaluate this item and whether its wording could be enhanced to increase its predictive power.

One important issue in interpreting these comparisons between the community and clinic-referred samples is that the two samples not only differed on referral status but they also differed on their ethnic composition, with the community sample being

predominantly Caucasian (77%) and the clinic-referred sample being predominantly African American (88%). Past research has suggested that, while the association between CU traits and severity of antisocial behavior is found in both Caucasian and ethnically diverse samples, the strength of the association is often weaker in samples with high rates of ethnic minority youths (Edens et al., 2007). Thus, although it is important that we did find some utility of the new specifier in a predominantly African American sample, we are unable to determine whether the differences between samples were due to referral status or the ethnic composition of the sample. Interestingly, one potential explanation that has been given for the weaker predictive utility of CU traits in ethnically diverse samples is that minority individuals may be rated as higher on these traits by non-minority raters. This is not likely an explanation for findings in our clinic-referred sample, as the

ratings of CU traits were from parents and from self-reports. Also, although we did not obtain the ethnicity of the teachers who rated students in the community sample, most teachers in the participating school systems were Caucasian. Further, in this community sample, both parents and teachers were more likely to rate African American students as being more likely to meet the CU specifier and, more importantly, the association between race and meeting the specifier was somewhat lower (ϕ -coefficient = .16, $p < .001$) for teacher ratings than for parent ratings (ϕ -coefficient = .19, $p < .001$). Thus, there was no evidence of an ethnic bias for teacher ratings relative to parent ratings. However, this is a critically important area for future research, which should continue to evaluate whether the CU specifier is valid across ethnic groups, as well as examine the most appropriate assessment methods to use across ethnically diverse individuals.

There were other limitations in the study that need to be considered when interpreting these results. Methodological differences between the studies make it challenging to isolate potential sources of any differences in the pattern of findings. For instance, the community sample used teacher and parent ratings to assess CD, while the clinic sample relied on semi-structured interviews of the youth and caregiver. By using multiple informants, it allowed us to study the effects of different informants on the prevalence and validity of the CU specifier. For example, in the community sample teachers rated a higher percentage of CD youth with CU traits (24%) than parents (10%). In the clinic sample, parents rated a higher percentage of CD youth with CU traits (31%) than youth themselves (21%). Despite somewhat different levels of endorsement, the validity across informants was quite similar. Thus, these findings support the utility of gaining information from multiple informants in the assessment of CU traits. Unfortunately, it was beyond the scope of this article to compare the different ways of combining informants but this is another important direction for future research, given that different combinatorial strategies may yield varying results (e.g. see Youngstrom, Findling, & Calabrese, 2003).

Another limitation within the clinic-referred sample was that the measures of impairment were general indices related to health and daily life activities. Measures of impairment more specifically related to CD, such as police arrests, school suspensions, or substance use may have showed clearer differences between CD groups with and without the CU specifier. On the other hand, inclusion of different methods and sampling strategies enhances confidence in the generalizability of findings that were consistent across both samples. Further, the measurement of the proposed specifier in both samples was based on standardized rating scales. It is unclear how likely clinicians are to use such assessment methods for making diagnostic decisions in typical practice. Also,

the study was correlational and, as a result, the association between CU traits and higher rates of aggression and cruelty should not be considered causal. It is possible that persons with CU traits lead someone to act more aggressively and cruel, but it is also possible that a history of aggression and cruelty could make someone callous to the pain and suffering of others. Finally, data were not available from each informant in all cases. Thus, the single-informant groups and combined-informant groups were based on somewhat different samples. We used this method because it utilized the most available data and approximated typical clinical practice, addressing concerns about clinical generalizability that are central to the DSM-V revision process. To determine how this methodology may have influenced our results, we repeated all analyses in both samples for only those with both informants; these analyses led to very similar results.

In addition to considering the validity of the proposed specifier, an additional consideration is the potential harmful consequences of using a pejorative label like 'callous-unemotional' as part of a diagnosis. Several issues are important in considering this concern. First, although there is no research directly testing the effects of the label 'callous-unemotional', there is an empirical literature studying the negative effects of the use of the term 'psychopathic traits' when applied to children and adolescents. A review of these studies suggests that the term 'psychopathic traits' does affect ratings of treatability by clinicians, as well as legal decisions made by judges and juries; however, it does not have more negative effects than the term 'conduct disorder' (Murrie, Boccaccini, McCoy, & Cornell, 2007). Thus, these results suggest that any diagnosis related to antisocial and aggressive behavior could have pejorative effects. Results also highlight one potential problem in not recognizing that only a small percentage of antisocial youths or children and adolescents with CD show characteristics associated with psychopathy; specifically, these terms can become viewed as being interchangeable. Second, previous attempts to capture CU traits in the DSM used names designed to reduce the potential stigmatizing effect of the label (e.g. 'undersocialized'; American Psychiatric Association, 2000), but the lack of clarity in this term led to great variability in how the construct was conceptualized and assessed by researchers and clinicians. Third, there is a danger that if terms that seem to connote a less severe disturbance (e.g. 'uncaring') are used for the specifier, this could actually be more harmful by resulting in many children and adolescents with less severe disturbances being diagnosed by clinicians.

Further, it is important to note that recent research examining the predictive utility of CU traits has shown these traits alone are associated with overall conduct and emotional problems, as well as general psychiatric difficulties in a large sample of

children and adolescents followed over 3 years (Moran et al., 2009). These findings suggest the presence of CU traits in youth, without conduct problems, could also be a clinically relevant group and future research should continue to examine this unique subgroup. This is particularly relevant for the clinic-referred children, given that a significant number of youth without CD met criteria for the CU specifier in our clinic sample. Also, there needs to be more research testing ways to improve the measurement of these traits for both clinical diagnoses and research (Johnstone & Cooke, 2004; Poythress et al., 2006). Finally, the current study examined the prevalence rate of the newly proposed DSM-V specifier in an outpatient clinic-referred and community sample. Thus, the impact of this specifier among detained youth, inpatient youth, and other samples which may include a large number of children with CD is warranted.

Conclusion

Within the context of these limitations and concerns, our findings suggest that the proposed specifier would identify a minority of children and adolescents with CD – but a minority that seems to have a more severe behavioral disturbance, especially related to aggression and cruelty. These findings, combined with past studies showing support for the predictive validity of these traits (Frick & Dickens, 2006); their ability to predict differential treatment response in youths with CD (Hawes & Dadds, 2005; Waschbusch et al., 2007); and their ability to designate youth with CD with distinct social, cognitive, emotional, and neurological characteristics (Frick & White, 2008) support the potential utility of this specifier for guiding both clinical practice and research with children and adolescents who show severe conduct problems. Research has found that if interventions are tailored to the unique needs of children and adolescents with CU traits, treatments can successfully reduce the antisocial behavior of these youths. Specifically, one study demonstrated

that increasing reward-oriented parenting reduced conduct problems in children with CU traits (Hawes & Dadds, 2005). Similarly, an intensive intervention which utilized reward-oriented approaches, targeted the interests of the adolescent, and taught empathy skills reduced recidivism in adolescents with CU traits in a residential treatment program (Caldwell, Skeem, Salekin, & Van Rybroek, 2006). Further, a study examining the effects of behavior therapy among children with CU traits demonstrated improvement in conduct problems and noncompliance after stimulant medication was added to the treatment regimen, suggesting a combination of therapeutic approaches may be beneficial for children and adolescents with high levels of CU traits (Waschbusch et al., 2007).

Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1 Prevalence of callous–unemotional specifier across diagnostic categories in clinic-referred and community samples

Table S2 Group comparisons on quality of life and functioning subscales in a clinic-referred sample

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Key points

- Proposed revisions for the DSM-V include a new specifier for the diagnosis of CD that would designate those 'with Significant Callous–Unemotional Traits'.
- Between 10% and 50% of youth across community and clinic-referred samples were designated with the proposed CU Specifier.
- Youth with CD and the DSM-V proposed CU specifier were higher on aggression and cruelty than those with CD without the specifier.
- The CU specifier appears to designate a unique group that is not solely accounted for by differences in aggression.
- A significant number of youth without CD met criteria for the proposed CU specifier suggesting this is a clinically relevant group that deserves further research.

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